FIG. 1

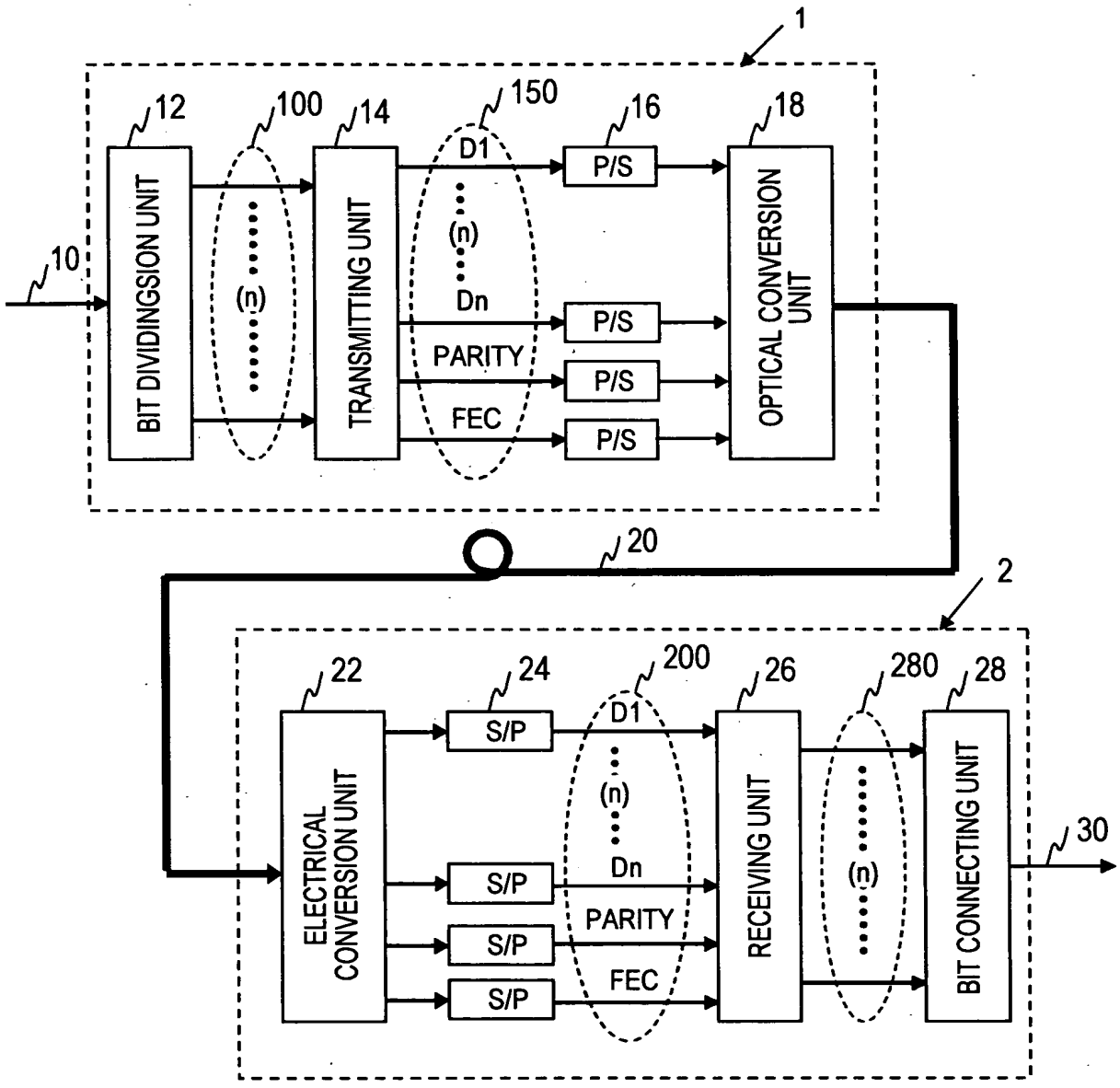

1
10
12
BIT DIVIDINGSION UNIT
100
(n)
14
TRANSMITTING UNIT
150
D1
(n)
Dn
PARITY
FEC
16
P/S
P/S
P/S
P/S
18
OPTICAL CONVERSION UNIT
20
2
22
ELECTRICAL CONVERSION UNIT
24
S/P
S/P
S/P
S/P
200
D1
(n)
Dn
PARITY
FEC
26
RECEIVING UNIT
280
(n)
28
BIT CONNECTING UNIT
30

FIG. 2

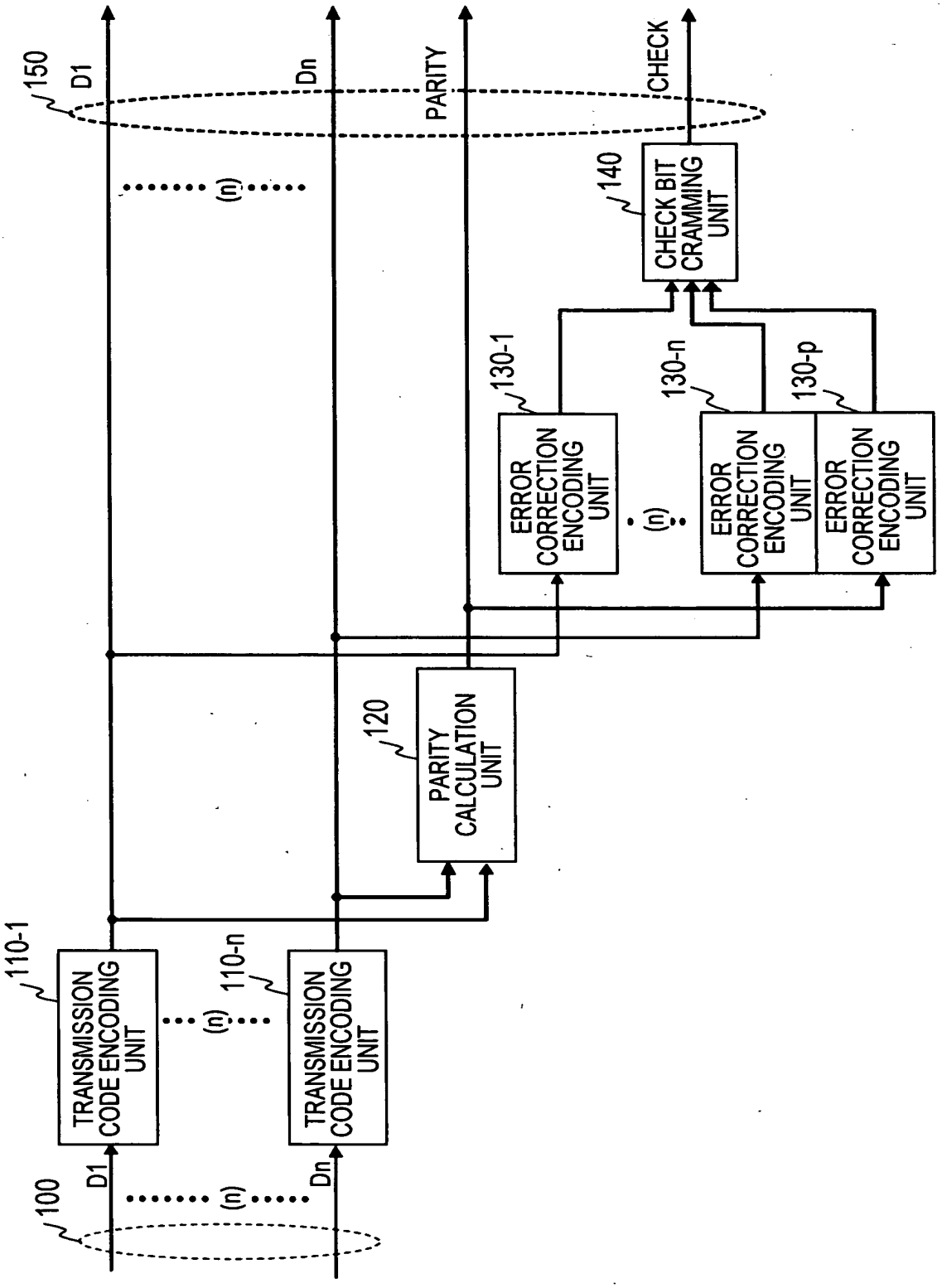

100
D1
(n)
Dn
110-1
TRANSMISSION CODE ENCODING UNIT
110-n
TRANSMISSION CODE ENCODING UNIT
120
PARITY CALCULATION UNIT
130-1
ERROR CORRECTION ENCODING UNIT
130-n
ERROR CORRECTION ENCODING UNIT
130-p
ERROR CORRECTION ENCODING UNIT
140
CHECK BIT CRAMMING UNIT
150
D1
(n)
Dn
PARITY
CHECK

FIG. 3

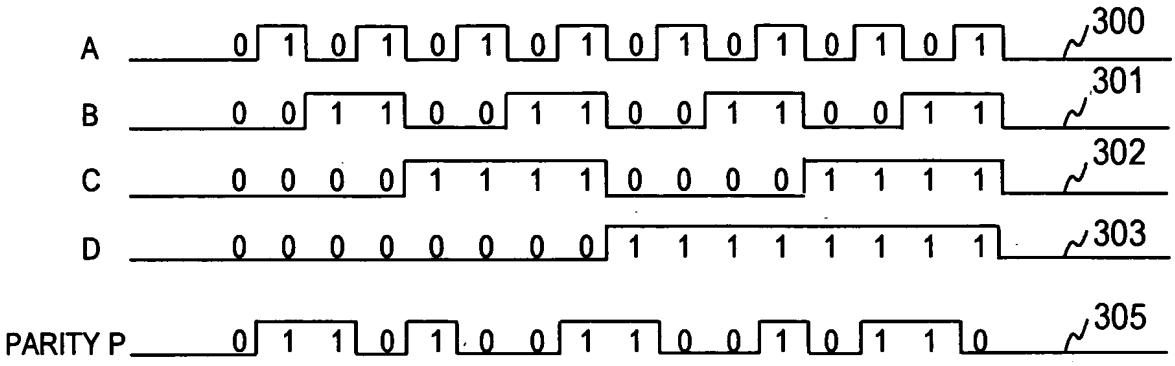

A
0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1
300
B
0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1
301
C
0 0 0 0 1 1 1 1 0 0 0 0 1 1 1 1
302
D
0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1
303
PARITY P
0 1 1 0 1 0 0 1 1 0 0 1 0 1 1 0
305

FIG. 4

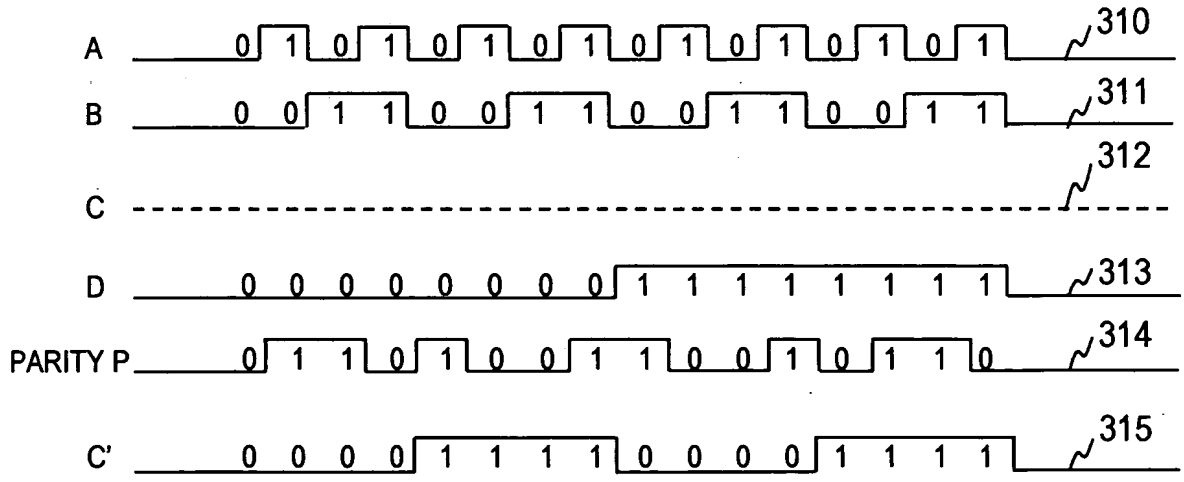

A
0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1
310
B
0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1
311
C
312
D
0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1
313
PARITY P
0 1 1 0 1 0 0 1 1 0 0 1 0 1 1 0
314
C'
0 0 0 0 1 1 1 1 0 0 0 0 1 1 1 1
315

FIG. 5

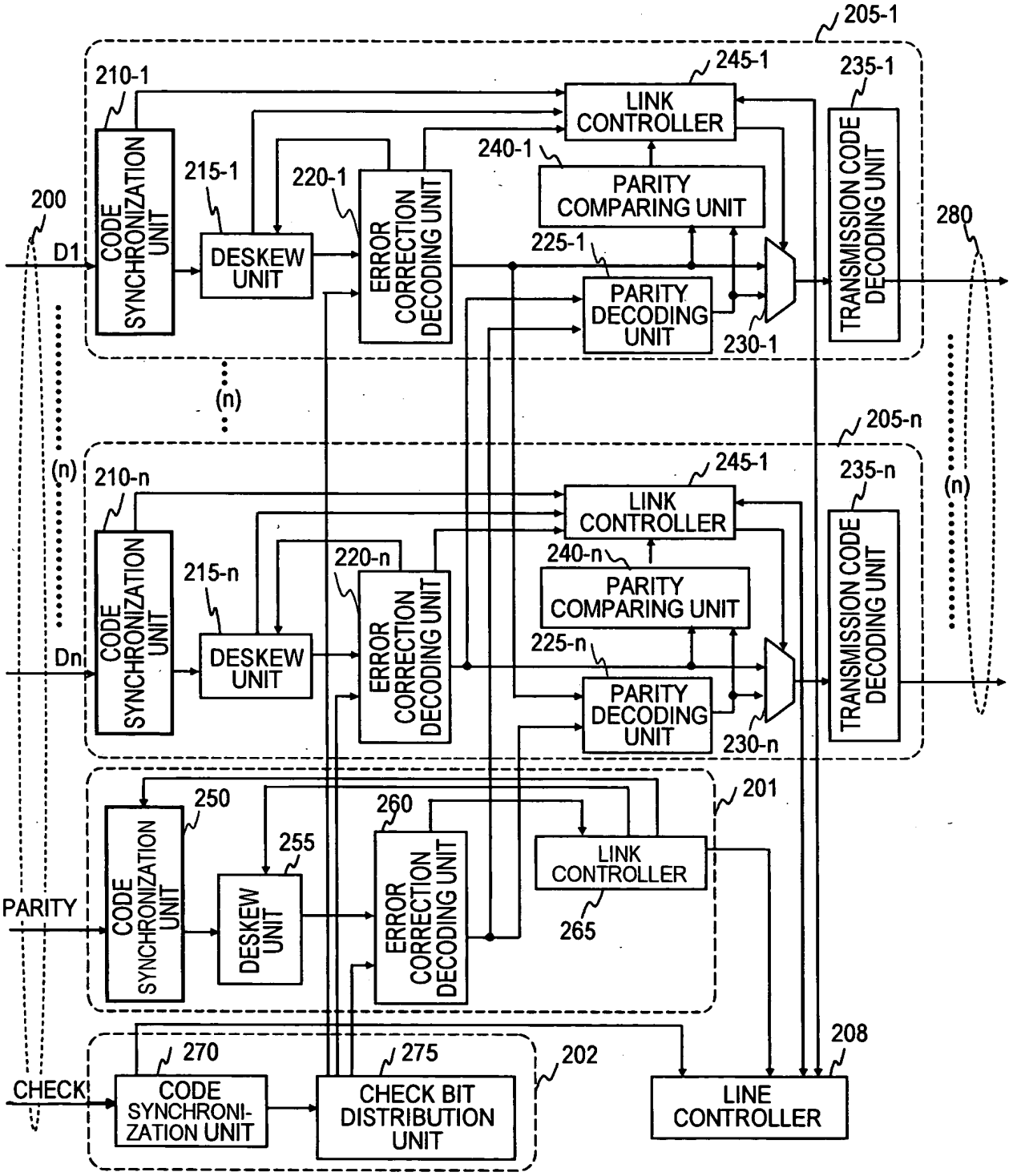

205-1
210-1
245-1
235-1
LINK CONTROLLER
240-1
PARITY COMPARING UNIT
215-1
220-1
200
D1
CODE SYNCHRONIZATION UNIT
DESKEW UNIT
ERROR CORRECTION DECODING UNIT
225-1
280
PARITY DECODING UNIT
230-1
TRANSMISSION CODE DECODING UNIT
(n)
205-n
210-n
245-1
235-n
LINK CONTROLLER
240-n
220-n
215-n
PARITY COMPARING UNIT
Dn
CODE SYNCHRONIZATION UNIT
DESKEW UNIT
ERROR CORRECTION DECODING UNIT
225-n
PARITY DECODING UNIT
230-n
TRANSMISSION CODE DECODING UNIT
201
250
260
255
PARITY
CODE SYNCHRONIZATION UNIT
DESKEW UNIT
ERROR CORRECTION DECODING UNIT
LINK CONTROLLER
265
208
270
275
202
CHECK
CODE SYNCHRONI-ZATION UNIT
CHECK BIT DISTRIBUTION UNIT
LINE CONTROLLER

FIG. 6

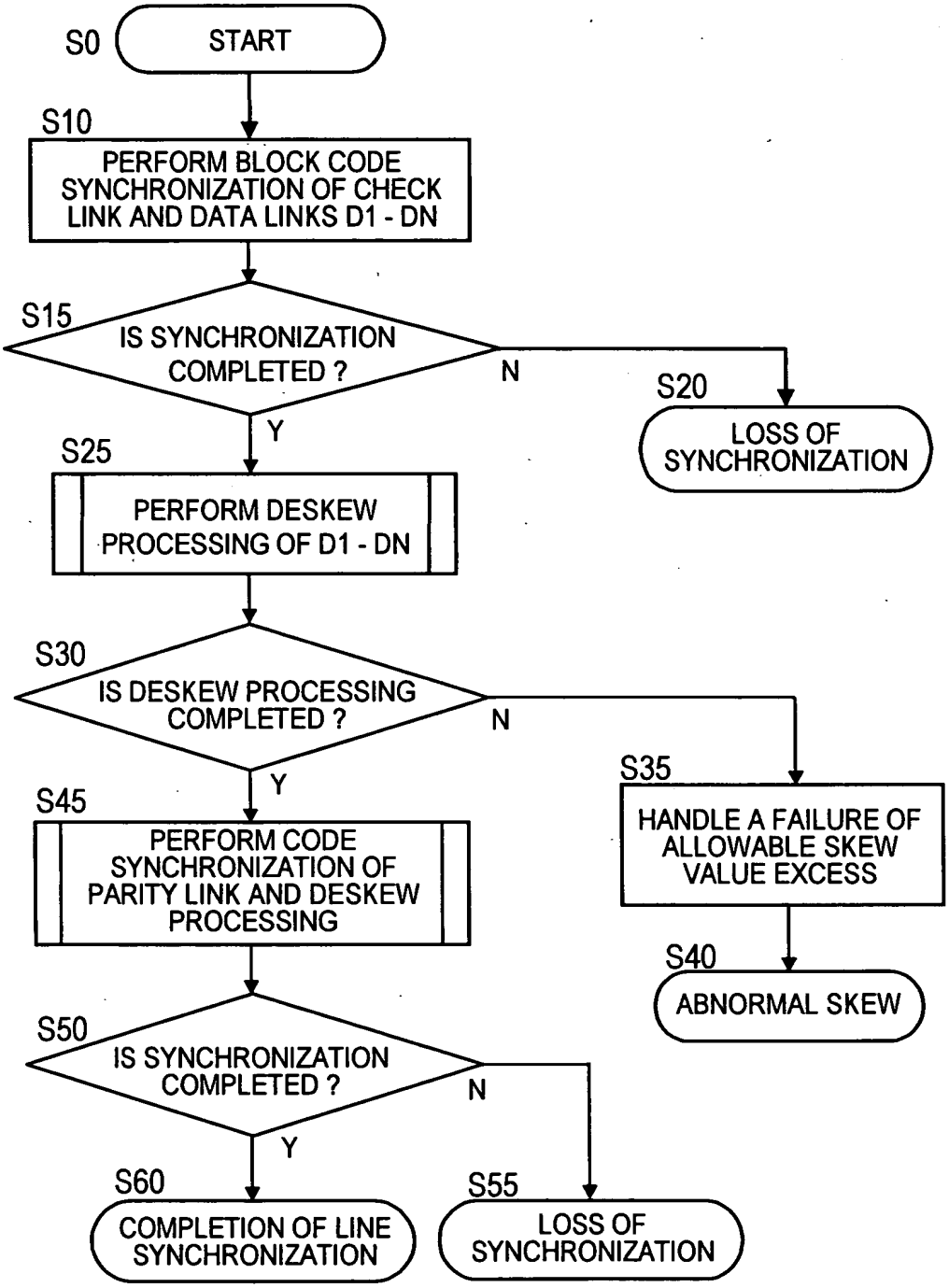

S0
START
S10
PERFORM BLOCK CODE SYNCHRONIZATION OF CHECK LINK AND DATA LINKS D1 - DN
S15
IS SYNCHRONIZATION COMPLETED ?
N
S20
LOSS OF SYNCHRONIZATION
Y
S25
PERFORM DESKEW PROCESSING OF D1 - DN
S30
IS DESKEW PROCESSING COMPLETED ?
N
S35
HANDLE A FAILURE OF ALLOWABLE SKEW VALUE EXCESS
Y
S45
PERFORM CODE SYNCHRONIZATION OF PARITY LINK AND DESKEW PROCESSING
S40
ABNORMAL SKEW
S50
IS SYNCHRONIZATION COMPLETED ?
N
Y
S60
COMPLETION OF LINE SYNCHRONIZATION
S55
LOSS OF SYNCHRONIZATION

FIG. 7

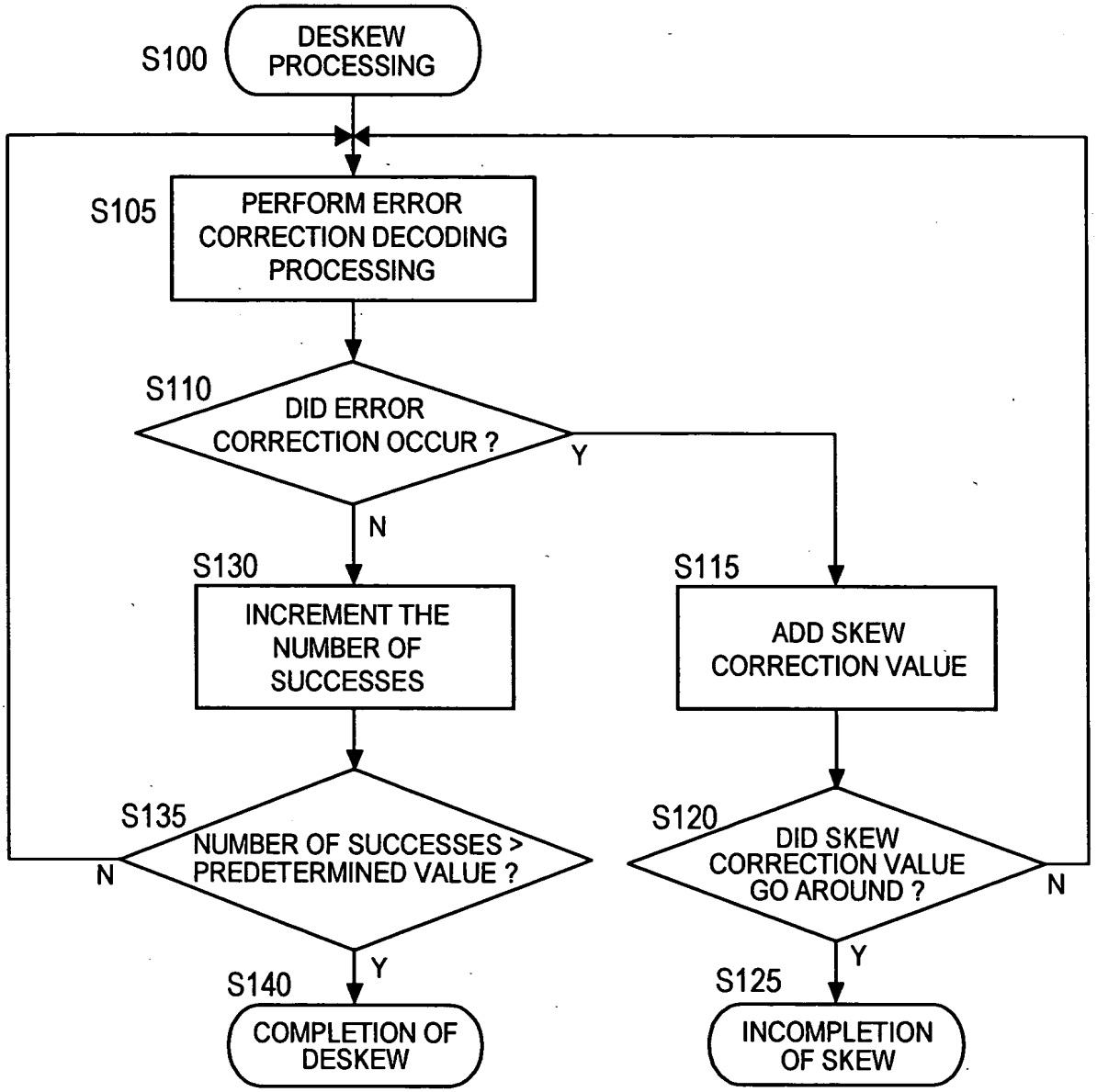

S100
DESKEW PROCESSING
S105
PERFORM ERROR CORRECTION DECODING PROCESSING
S110
DID ERROR CORRECTION OCCUR ?
Y
N
S130
INCREMENT THE NUMBER OF SUCCESSES
S115
ADD SKEW CORRECTION VALUE
S135
NUMBER OF SUCCESSES > PREDETERMINED VALUE ?
N
Y
S120
DID SKEW CORRECTION VALUE GO AROUND ?
N
Y
S140
COMPLETION OF DESKEW
S125
INCOMPLETION OF SKEW

FIG. 8

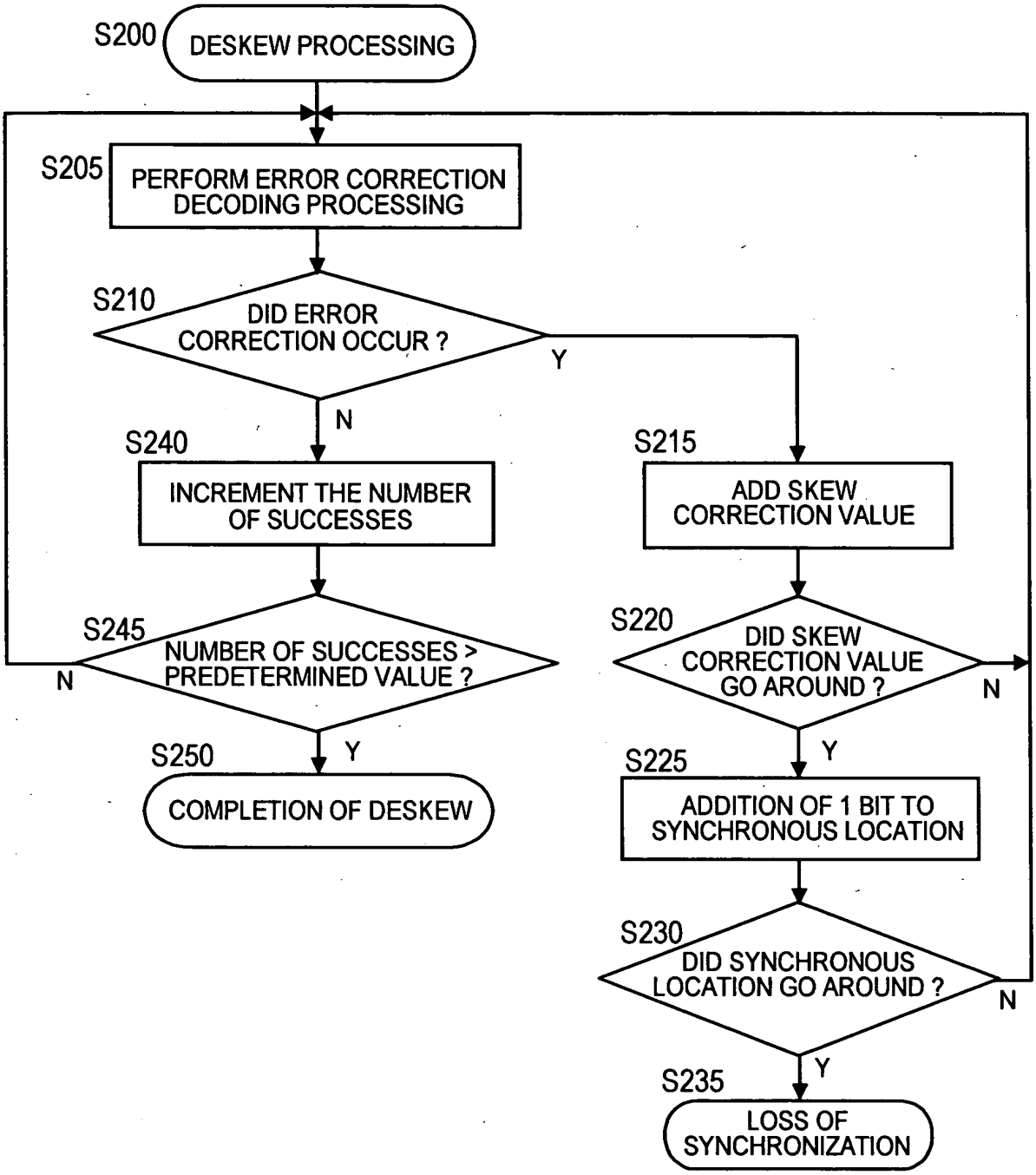
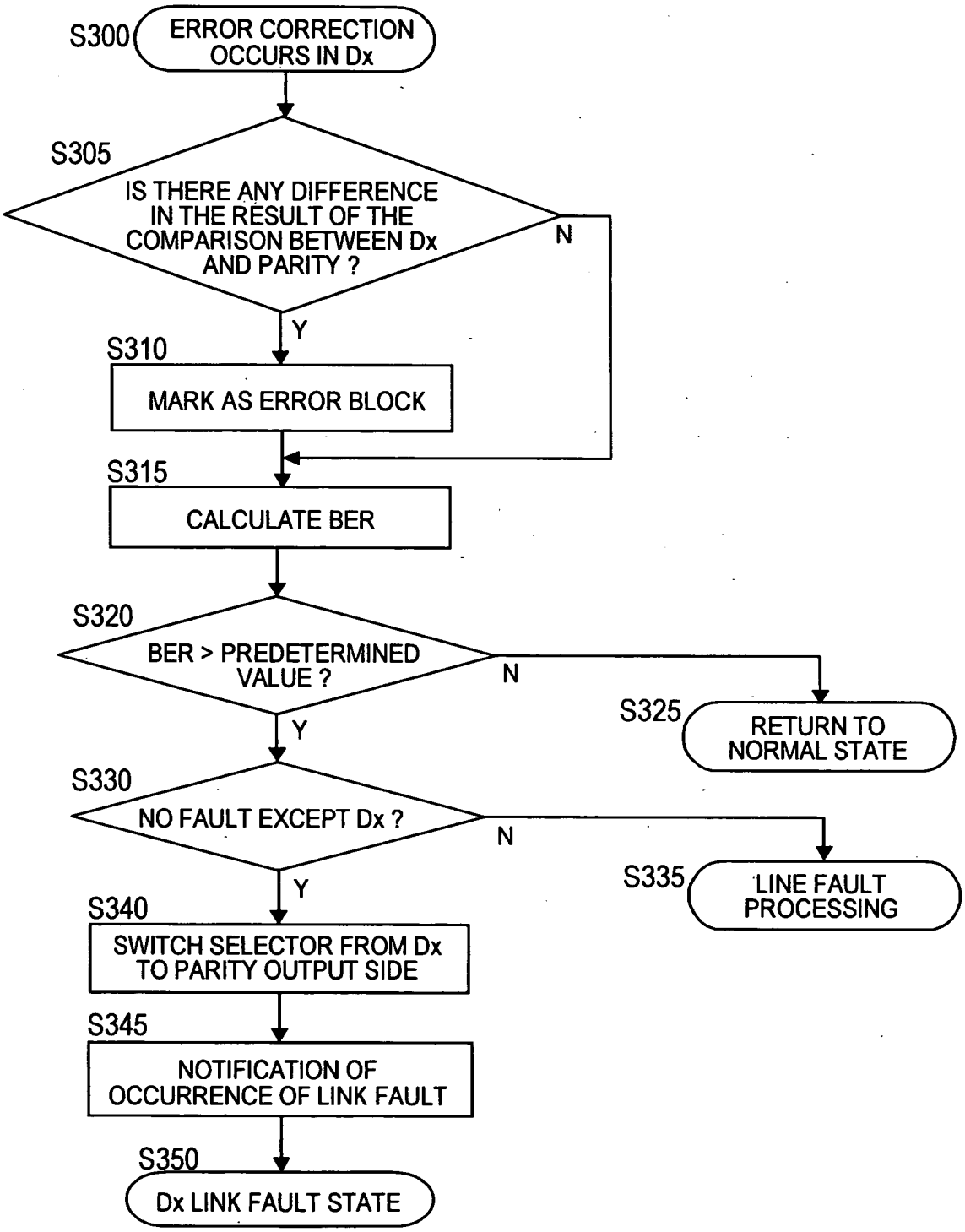

S200
DESKEW PROCESSING
S205
PERFORM ERROR CORRECTION DECODING PROCESSING
S210
DID ERROR CORRECTION OCCUR ?
Y
N
S240
INCREMENT THE NUMBER OF SUCCESSES
S245
NUMBER OF SUCCESSES > PREDETERMINED VALUE ?
N
Y
S250
COMPLETION OF DESKEW
S215
ADD SKEW CORRECTION VALUE
S220
DID SKEW CORRECTION VALUE GO AROUND ?
N
Y
S225
ADDITION OF 1 BIT TO SYNCHRONOUS LOCATION
S230
DID SYNCHRONOUS LOCATION GO AROUND ?
N
Y
S235
LOSS OF SYNCHRONIZATION

FIG. 9


S300
ERROR CORRECTION OCCURS IN Dx
S305
IS THERE ANY DIFFERENCE IN THE RESULT OF THE COMPARISON BETWEEN Dx AND PARITY ?
N
Y
S310
MARK AS ERROR BLOCK
S315
CALCULATE BER
S320
BER > PREDETERMINED VALUE ?
N
Y
S325
RETURN TO NORMAL STATE
S330
NO FAULT EXCEPT Dx ?
N
Y
S335
LINE FAULT PROCESSING
S340
SWITCH SELECTOR FROM Dx TO PARITY OUTPUT SIDE
S345
NOTIFICATION OF OCCURRENCE OF LINK FAULT
S350
Dx LINK FAULT STATE